

## **Demo System Integrates Emerging Technologies for the Extended PC**

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### Overview

High-speed I/O technologies make the extended PC a working reality. Intel's Hannacroix concept PC is a demonstration system that showcases multiple integrated, high-speed I/O technologies in a working platform. This new high-tech PC has just about every feature a developer or user could want, including:

- Intel® Pentium® 4 Processor Performance with the Intel® 850 chipset
- Two types of wireless connectivity: 802.11b and Bluetooth® wireless technology
- Multiple high-speed I/O connections including USB2.0 and IEEE 1394a
- Next-generation storage I/O utilizing Serial ATA
- Multi-channel high-performance audio via six analog outputs or S/PDIF (Sony/Philips Digital Interface)
- Control features for personal video recorders and home theater systems
- Legacy-free platform for simplified user cable connections

The Hannacroix concept PC showcases working technologies from a multitude of vendors. In various combinations, these technologies let developers create an exciting PC experience for end users, while still differentiating their systems from the competition.

### Wireless Features

The Hannacroix concept PC supports wireless technologies 802.11b for networking multiple PCs and Bluetooth for personal device connectivity. This combination of features allows always on, seamless connectivity of devices depending on usage needs.

The high-speed Home Gateway Communications Network Riser (CNR) card provides 802.11b wireless connectivity. This card supports fast, easy connectivity anytime, anywhere to a network of devices in the home or office. The Intersil 802.11b wireless solution is integrated onto the Home Gateway CNR card to let users connect to other PCs, tablets, and personal digital assistants (PDAs). For streamlined aesthetic appeal, the maximum performance Molex antenna is integrated directly into the chassis design.

Also featured in the Hannacroix concept PC, leading-edge Bluetooth wireless technology eliminates the need for cables or base stations between the PC and the mouse, keyboard, printer, and other input and output devices. The system uses an internal Universal Serial Bus (USB) 1.1-based Bluetooth solution from Silicon Wave. This Bluetooth technology is integrated directly onto the motherboard to make connectivity to peripheral devices easy and neat.

### High-Speed I/O

The extended PC relies on high-speed I/O connections to offer simple and seamless connectivity. Advanced connection technologies let users create a complete home system for printing, scanning, audio, and video (cameras, DVD, etc.).

Showcased in the Hannacroix concept PC, multiple high-speed technologies are available through a variety of standards, from a variety of vendors. When combined, these technologies make it easy to connect printers, scanners, cameras, MP3 players, and a host of other devices to a single extended PC.

The Hannacroix concept PC supports a variety of connection capabilities in a single box:

- USB (Universal Serial Bus) 2.0 high-speed I/O. Users need these ports to configure and upgrade their systems with high-bandwidth peripherals, such as printers, scanners, and cameras. For greatest flexibility, the Hannacroix concept PC has these ports in many locations: ease-of-use front panel, legacy-free back panel, communications network riser (CNR) card, and internal auxiliary connector. Access to the high-speed ports is via an NEC Electronics USB2.0 five-port host controller on the motherboard, and also via a four-port USB2.0 hub. The Hannacroix concept PC offers four more high-speed USB ports on the system's Home Gateway CNR card, via a Cypress Semiconductor four-port USB2.0 hub. One of these ports is accessible to the user for connection to an internal device.
- IEEE 1394a interconnect standard. The Hannacroix concept PC uses a three-port 1394a solution to take full advantage of the power of its Intel Pentium 4 processor. This solution lets users maintain high-speed connections between the PC and their various video-input devices. The Agere Systems 1394a controller, which is ideal for connecting to consumer electronics, achieves plug-and-play compatibility with a myriad of existing devices. With a Foxconn stacked 1394/USB connector, developers can support 1394a and at the same time, conserve precious I/O real estate on the motherboard.
- LAN (local area network). A LAN lets users use cable modems, DSL, or broadband to connect to a network. It also offers high-speed access between devices in a user's home or office. The Hannacroix concept PC actually includes two LAN ports to support two separate LAN connections. This lets users have, for example, broadband access through one port, while using the other port to connect to another PC. The USB2.0-based 10/100 LAN connection for network and broadband connectivity is provided via the Kawasaki LSI High-Speed Fast Ethernet solution. Dual-Ethernet capability is achieved by combining the KLSI solution with the Intel® PRO/100 VE Network Connection on the motherboard.
- HPNA (home phone-line networking). With HPNA, users can network PCs in different locations in the home using existing phone lines. For example, they could connect a PC in the den to another in a teen-ager's bedroom. The Hannacroix concept PC uses the Home Gateway card's HPNA 2.0 implementation to provide these connections.

## Serial ATA

Serial ATA (SATA) is an exciting new storage technology that offers:

- Smaller cabling
- Easier integration, since wide, unwieldy ribbon cables are replaced with narrow, thermally unobtrusive serial cables
- Better system thermals, since thinner wire density allow for increased air flow
- Next-generation storage bandwidth

The Hannacroix concept PC achieves ultra-fast data-transfer and data-access rates by using a combination of the Marvell SATA bridge chip, and the Seagate native SATA hard disk drive.

## Performance Audio

Audiophiles can no longer ignore the PC as a performance audio system. A combination of Pentium 4 processor, the Intel® ICH2 (I/O Controller Hub 2) AC'97 interface, and the Cirrus Logic 4201 Codec demonstrate that an extended PC can now offer a full, immersive audio experience while maintaining an integrated audio cost structure.

The Hannacroix concept PC can drive up to six analog speakers to deliver a full surround-sound experience. Alternatively, the system can control a complete digital-5.1 speaker ensemble. Using a single DVD/CD drive, users can play DVDs, MP3 files, games, and CDs. With wireless connectivity, users can play audio through the computer or remote speaker system, and they can play DVDs via computer or TV. The Hannacroix concept PC shows that all this can now be accomplished with little or no loss of sound quality compared with high-end home theater systems.

## Summary

The Hannacroix concept PC shows the Intel's desktop vision and demonstrates technology a platform ahead.

- Integrated high-speed I/O technologies already deliver on the promise of the Extended PC.
- Smart wireless solutions allow the platform to adjust to the user's needs.
- Serial ATA technology provides headroom for next-generation storage demands.
- Multi-channel audio makes digital content come alive.

The Hannacroix concept PC has been created to show developers and integrators ideas, technologies and futures to help them design and build exciting future pc platforms. This product was created not for resale, but as a demonstration project to show how available technologies and future ideas can be implemented in exciting ways. We encourage our customers to develop their own innovative PC platforms utilizing Intel® Desktop Boards, which feature leading technologies, and snap integration. Our desktop boards have rock solid performance and a reputation for reliability and durability that is proven through our extensive testing. For more information on our [available products](#) visit the Intel Developer site.

## More Info

For more information about the Hannacroix concept PC, check the [Intel Desktop Boards](#) area of the Intel Developer site.

You can also find information about specific Hannacroix concept PC features from the various vendors whose technologies contributed to the system:

- [Intersil 802.11b](#)
- [Silicon Wave Bluetooth](#)
- [Molex 802.11b Antenna and SATA](#)
- [NEC USB2.0 Controller and HUB](#)
- [Cypress USB2.0 HUB](#)
- [Agere 1394a Controller](#)
- [Foxconn USB/1394 Connector](#)
- [Seagate SATA Hard Disk Drive](#)
- [Marvell SATA Bridge](#)
- [Cirrus Logic Audio Codec](#)
- [Kawasaki LSI USB2.0 Fast Ethernet](#)

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## Author Bios

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